PAPERLESS RECORDER

DATA SHEET PHW

OVERVIEW

This is a paperless recorder that displays measured data on the LCD in real time and stores data in CompactFlash.
The type of input such as thermocouple, resistance bulb, D.C. voltage (current), etc. can be arbitrarily set to 36 channels at the maximum.
The data stored in CompactFlash can be regenerated on the screen, and the use of supplied support software allows the data to be regenerated on a PC screen.
The data recorded in ASCII format can be directly read in a spreadsheet such as Excel, which facilitates the processing on a PC.

FEATURES

1. Large capacity storage by CompactFlash
   Measured data is periodically stored in CompactFlash. In case of 512MB, for example, display files for about one year (display refresh cycle 30 sec) can be taken up (in case of ASCII data format, 27 channels, Max/Min recording).
2. Quick search and display of past data
   Data stored in CompactFlash can be displayed in succession by scrolling the screen.
3. Various display capability
   Depending on the object of measurement, the most suitable display format can be selected from a variety of formats including bar graph display, trend display, digital display, etc.
4. PC support software supplied as standard
   Loader software that enables easy display and change of set data and data viewer software that regenerates the data stored in CompactFlash are supplied as standard.
5. 36-point recording
   12 types of thermocouples, 2 types of resistance bulbs and DC voltage/current input can be recorded up to 36 points.
6. LCD extinguishing function
   Automatically extinguishes the LCD if nothing is operated for certain time. You can set the time after a lapse of which the LCD is extinguished via parameter "LCD extinguishing time". The settable range is 0 to 60 minutes. Setting at 0 minute overrides the function, whereby the LCD will never extinguish.
   This function prevents the backlight life from shortening uselessly. During the extinguishment, the power consumption can be reduced.
7. Ethernet function (Option)
   FTP, Web server, e-mail and MODBUS-TCP are available using 10Base-T.

SPECIFICATIONS

Input system

Number of input points:
9, 18, 27 or 36 points (Can be selected at the time of purchase)

Input circuit: Input mutual isolation (See "Others" on page 5 for the withstand voltage)
Resistance bulb measured current: about 1 mA

Measuring cycles:
9 or 18 points....100ms cycles
27 or 36 points....200ms cycles

Recording cycle: 1 second to 12 hours

Input types: Thermocouple, resistance bulb, DC voltage, and DC current (Shunt resistors are fitted in input terminals. One resistor is necessary per point.).
Note) Provide a shunt resistor (type: PHZP0101) separately.

Measuring range:

Input types		Reference range
Thermocouple	B	400.0 to 1760.0°C
	R	0.0 to 1760.0°C
	S	0.0 to 1760.0°C
	K	–200.0 to 1370.0°C
	E	–200.0 to 800.0°C
	J	–200.0 to 1100.0°C
	T	–200.0 to 400.0°C
	N	0.0 to 1300.0°C
	W	0.0 to 1760.0°C
	L	–200.0 to 900.0°C
	U	–200.0 to 400.0°C
	PN	0.0 to 1300.0°C
Resistance bulb	JPt100	–200.0 to 600.0°C
	Pt100	–200.0 to 600.0°C
DC voltage	50mV	0.00 to 50.00mV
	500mV	0.0 to 500.0mV
	1-5V	1.000 to 5.000V
	0-5V	0.000 to 5.000V

Note) B, R, S, K, E, J, T, N : JIS C 1602, DIN IEC 584-1
W : 5%Re-26%Re · W (Hoskins Mfg. Co. USA)
L : Fe-Cu · Ni (DIN 43710)
U : Cu-Cu · Ni (DIN 43710)
PN: Platinel
JPt100 : JIS C 1604-1989 (Old JIS Pt 100)
Pt100 : JIS 1604, DIN IEC 751

Selection of input types:
By key operation on the front panel. Note that the same input type (thermocouple, resistance bulb, voltage) should be set every 2 channels. Refer to "Setting method of input types" on page 12 for details.

Burn-out function:
Provided as standard for thermocouple and resistance bulb inputs. If the input has been open-circuited, the recording level swings over 100%.
Thermocouple burn-out current:
approx. 0.2 μA

Input filter function:
Settable for each channel (primary delay filter)
Time constants are settable in the range from 0 to 900 sec.

Scaling function: Possible by DC voltage (current) input
Scaling range: -32767 to 32767
Decimal position:
Settable at any point
Unit symbol: Selectable out of 125 different units or 12 user units of up to 7 characters.

Subtraction function:
Subtraction between each channel is allowed.

Totalizing function:
The measured value of each channel can be totalized. Applicable to daily, monthly, annual or external input totalizing.

F value calculation function:
F value (extinction value of bacteria by sterilization by heating) can be calculated from the measured temperature by each channel.

Square rooter function:
Square rooter can be performed against the input value per each channel.

Computation function:
The following calculation is available with the computation function.
(1) Computation function:
Addition, subtraction, multiplication, division, absolute value, exponential, square-root extraction, LOG, LN, EXP, humidity, maximum, minimum, average, and integration.
(2) Computation input enable:
Analog input (Ch1 to 72), integration input (Ch1 to 72), DI (DI1 to 16), communication input (No.1 to 36), and constant number (No.1 to 60).

Indication system

Indicator: 12" TFT color LCD (800 x 600 dots) with backlight, no contrast adjustment. On the LCD, certain picture elements remain lit or extinguished. On account of the nature inherent to LCD, the brightness may be non-uniform. But, such are not troubles.

Color of indication:
14 colors

Applicable language:
English, Japanese

Life of backlight: 50,000 hours in terms of total lighting time.
(Replace the backlight as a set of display unit. If the LCD extinguishing function is resorted to, the LCD can be used longer as much.)

Trend display: Direction: vertical and horizontal
Number of channels: 10, 6 or 4 channels per screen group. (Input: 72 points at the maximum).
Display refreshment cycles:
select from 1 second to 12 hours
Scale display or no-display can be selected.

Bar graph display:
Number of channels: 10, 6 or 4 channels per screen group. (Input: 72 points at the maximum).
Display refreshment cycles: 1 second

Analog meter display:
Number of channels: 10, 6 or 4 channels per screen group. Display in bar graphs or in analog meters can be selected.
Display refresh cycle: 1 second

Digital display: Number of channels: 10, 6 or 4 channels per screen group. (Input: 72 points at the maximum).
Display refreshment cycles: 1 second

Totalizing data display:
Number of channels: 10, 6 or 4 channels per screen group. (Input: 72 points at the maximum).
Display refresh cycle: 1 second

Event summary display:
Alarm summary and message summary can be displayed. The message occurrence information and message display can be switched.

Ethernet log display:
E-mail sending, FTP server log in/off and MODBUS TCP/IP communication start/stop can be displayed.

Parameter display/set:
Already-set Data Display and Set Change Display screen

TAG indication: Number of characters to be displayed:
Up to 8 characters
Up to 8 characters (Note 1) at 10 or 6 channel display.
Up to 16 characters at 4 channel display.
Note 1: Up to 7 characters only can be displayed on certain screens.
Characters to be displayed:
Alphanumerics.
Tag, unit and channel No. display: Which can be displayed depends on the particular screen. Refer to the table below. (Keywords only are extracted.)

Screen	Channnels per screen	Item			
		Tag 1	Tag 2	Unit	Ch No.
Trend bar graph	4 or less	◎	◎	◎	◎
	5, 6	○	×	○	○
	7 or more	△	×	△	△
Analog meter	6 or less	◎	◎	◎	◎
	7 or more	○	×	○	○
Instantaneous value		◎	◎	◎	◎

◎: All items can be displayed.
○: Items except for Tag 2 can be displayed.
△: 1 item only can be displayed.
×: Nothing can be displayed.

Historical trend display:
Displays past recording data read from compact flash, currently recording data or just recorded data. The recording chart can be scrolled or, via time designation, the control can jump to an arbitrary recording chart.

Number of screen groups:
8 groups (Up to 10 channels per 1 group can be registered.)

Keyboard

No. of Keys: 8

Function: Use to select various screens and set various parameters.

Recording function

External memory media:
CompactFlash card
Format according to FAT16 or FAT. Otherwise, reading and saving are impossible.

Recording capacity:
1 GB maximum (CompactFlash). Limiting the recording file to 64MB is recommended (35 days for the number of input points of 36 and the display refresh cycle of 30 seconds.)
If impossible, up to 256MB is tolerated. (140 days at the display refresh cycle of 30 seconds.) A file recorded beyond may not be opened.

Note 1) Decide the recording capacity, referring to Table 1 on page 7.
Note 2) If the recording capacity is beyond those mentioned above due to performance of PC, a file recorded may not be opened.
Note 3) Change the compact flash every six month to prevent data losing and check if there is no problem.

Recording method:
Turning ON the REC key allows measured data to be written at fixed cycles.
Recorded as a new file whenever the recording starts.

Data save cycles:
Linked to the display refreshment cycles on the "Real Time Trend" screen. However, they are automatically set to about 1 minute if the refreshment cycles are set to less than 1 minute.

Trend data: Measurement data sampled at measurement cycle is saved in terms of mean value, instantaneous value or Max/Min value.

Event data: Saves alarm data and message data. Further saves power ON and OFF, if any, after starting recording.

Totalizing value data:
Records the totalized data according to the totalizing type selected by channels. Values by totalizing types or total from the beginning of totalizing, whichever selected, can be recorded. For each channel, the input value totalizing, number of DI inputs or measurement at times when DI inputs have occurred can be selected. Input values to be totalized are selected from daily report, monthly report, yearly report and external input.
If power has been turned off and on while totalizing, the totalizing is resumed at last value. (Last value remains saved, but data during power OFF is not totalized.)

Configuration data:
Configuration data can be saved. And this data can also download to recorder.

Storage capacity:
About one year at the display refresh cycle of 30 seconds (in case of 27-channel recording in ASCII data format, Max/Min recording, and 512MB CompactFlash used.) Refer to Table 2.

Residual capacity of memory:
Indicates how much of the memory card has been used on the screen. If the residual capacity is none, the recording stops.

Compact flash card form: PHZP1301, PHZP2801
(CF card) (If a card other than the above is used, no operation assurance is ensured. Meanwhile, as for other CF cards for which operation check will have been completed, the results will be posted on our company's homepage sequentially. Please refer to this website.)

Data format: Either of ASCII or binary format can be selected. (Switching cannot be made while the recording is in progress. In the case of ASCII format, the data can be directly read on Excel, etc. The data recorded in binary format cannot be read directly.)
Approximately 166 bytes per sampling for Max/Min recording of 9-channel input in ASCII format, or approximately 40 bytes for Max/Min recording of 9-channel input in binary format.

Alarm function

No. of settings: Up to 4 alarms for each channel are settable.
Type of alarm: High/Low limits
Indication: Status (alarm types) is displayed on digital display unit when an alarm occurs.
Historical display on alarm summary (Alarm start/cancel time and alarm types)
Hysteresis: Set within the recording range of 0 to 100%
Acts on high or low limit alarm, and does not affect the battery alarm nor memory full alarm.
Relay output: Number of points; 20 (option: Up to 2 cards with relay output can be mounted.)
Transistor output (open collector output):
16 points (option)
Alarm latch function:
Holds alarm indication and alarm output even after measurement value has left the alarm range.
ON/OFF operation is performed according to key setting.

Power supply

Rated power voltage:
100 to 240V AC
Range of operating voltage:
90 to 264V AC
Supply frequency:
50/60Hz ±2% (both employable)
Power consumption

Power voltage	Consumption
100V AC	About 65VA
240V AC	About 80VA

Structure

Mounting method:
Panel-mounted (vertical panel)
Thickness of panel:
2 to 26 mm
Materials: Steel sheet for case, PC-ABS for bezel
Color: Silver for case, Munsell N2.0 (black) for bezel
External dimensions:
300 (W) × 300 (H) × 220.5 (D) mm
Mass: About 4.7 kg (9-point input, without option)
About 6.4 kg (full option)
External terminal board:
Input terminal: M3 screw terminal
Power terminal: M4 screw terminal

Operating condition

Power supply voltage:
90 to 264V AC
Power supply frequency:
50/60Hz ±2% (sharing)
Ambient temperature:
Without Ethernet function: 0 to 50°C*1
With Ethernet function: 0 to 40°C*2
Ambient humidity:
20 to 80%RH
Vibration: 10 to 60Hz 0.2m/s^2 or less
Shock: None
Magnetic field: 400 A/m or less
Signal source resistance:
Thermocouple input .... 1kΩ or less
Resistance bulb input .... 10Ω/wire or less (resistance of each wire of 3-wire system should be balanced).
Voltage input .... 0.1% or less of input resistance
Mounting posture:
Forward tilt 0, backward tilt within 30, horizontal 0
Warm-up time: One hour or more after power ON

*1: In case of the 12th digit of ordering code is "Y".
*2: In case of the 12th digit of ordering code is "E".

Reference standard

Accuracy/resolution:
Measuring conditions (23±2˚C, 65±10% RH, power voltage, frequency fluctuation within ±1%, no external noise, warm-up time of 1 hour or more, vertical mounting, standard values of signal source resistance and wiring resistance... within 1%)

Input types		Digital indication accuracy Note 1	Digital indication resolution
Thermocouple	B R S K E J T N W L U PN	±(0.15%+1 digit) ±(0.3%+1 digit) for the range shown below Thermocouple B : 400 to 600°C Thermocouples R and S : 0 to 300°C Thermocouples K, E, J, T, L and U : –200 to –100°C	0.1°C
Resistance bulb	JPt100 Pt100	±(0.15%+1 digit)	0.1°C
DC voltage	50mV 500mV 5V	±(0.15%+1 digit)	10V 100V 1mV

Note 1) Digital indication accuracy is a percentage (%) with respect to input range of 1 page.
Note 2) No error of reference contact compensation of thermocouple is included.

Error of reference contact compensation:
K, E, J, T, N, L, U, PN: ±0.5˚C
R, S, B, W: ±1.0˚C
(when measured at 0˚C or more)
Max. input voltage:
Thermocouple, resistance bulb,
DC voltage: ±10V DC (continuous)
Input impedance: Thermocouple,
DC voltage: About 1MΩ

Others

Clock: With calendar function (Christian era)
Accuracy: ±100 ppm or less (monthly error: about 4 minutes)
At the ambient temperature of 23±2°C, not including the error at power ON/OFF.

Memory backup: Parameters are saved to the internal non-volatile flash memory.
The clock is backed up with built-in lithium battery.
Trend data is not backed up.

Insulation resistance:
100 MΩ (when measured between each terminal and ground by using a 500V DC megger)

Withstand voltage:
Input terminal – input terminal: 500 V AC, 1 min
Power terminal – ground: 2000V AC, 1 min
Input terminal – ground:500V AC, 1 min
Alarm terminal (contact output) – ground: 2000 V AC, 1 min
Alarm terminal (contact output) – alarm terminal (contact output): 750 V AC, 1 min
Communication terminal – ground: 500 V AC, 1 min
Alarm terminal (open collector) – ground: 500 V AC, 1 min
Power terminal – input terminal: 500 V AC, 1 min

Effect on operation

Effect of power supply fluctuation conditions:
For the fluctuation in the range from 90 to 264V AC (frequeucy: 50/60Hz)
Reading change: ±(0.2%+1 digit) or lower.
For the fluctuation in the range from 47 to 63Hz (power voltage: 100V AC)
Reading change: ±(0.2%+1 digit) or lower.

Effect of input signal resistance:
Thermocouple input: 50μV±1 digit per 100Ω
DC voltage: Fluctuation for resistance value equivalent to 0.1% of the input resistance: ±(0.2%+1 digit) or lower.
Reistance bulb (for wiring resistance of 10Ω for 1 line (the same for 3 lines))
Reading change: ±(0.2%+1 digit) or lower.

Effect of ambient temperature:
Reading change: ±(0.3%+1 digit)/10°C or lower.

Effect of Mounting position:
For the backward 30° slant
Reading change: ±(0.2%+1 digit) or lower.

Effect of vibration:
When sine wave of 10 to 60Hz with the acceleration of 0.2m/s^2 is applied in each direction for 2 hours.
Reading change: ±(0.2%+1 digit) or lower.

Safety and EMC standard

Safety standard: Based on IEC61010-1
EMC standard: Based on EN61326

Transportation/storage conditions

Temperature: -10 to +60°C
Humidity: 5 to 90%RH
Vibration: 10 to 60Hz, 2.45 m/s^2 or lower
Shock: 294m/s^2 or lower (packed state)

Additional function (option)

■ Alarm relay output (11th digit of code symbols: "1", "2", "4" or "5")
Up to 2 cards with 10-point relay output can be mounted. (Maximum 20 points)

Terminal structure:
M3 screw terminal

Alarm relay output:
1a contact output (10 points/card),
Individual channel or common output (OR output) allowed.
Rating: Contact capacity 240V AC/3A, 30V DC/3A (Resistive load).

■ Alarm open collector output (11 digit of code symbols is "3", "4" or "5")
Card having 16 alarm points (open collector output) can be mounted.

Terminal structure:
M3 screw terminal

Alarm output: Open-collector transistor output (16 points)
Rating: 30V DC/0.1A (resistance load)

■ DI input (7 digit of code symbol is "1")
Card having 16 DI input can be mounted.

Terminal structure:
M3 screw terminal

DI input: No-voltage contact input (16 points).
Contact input allows following controls.
(1) Recording start/stop
(2) Message set
(3) F value calculation reset
(4) Totalizing start/stop
(5) Totalized value reset
(6) LCD (backlight) lighting
(7) E-mail sending

Input pulse width:
ON pulse width: 400msec or more
OFF pulse width: 400msec or more

Ethernet (Option)

The following can be performed through the Ethernet function.

■ HTTP server (Internet Explorer 6 is available) Note 1

Measurement display:
Digitally displays the measurement of each channel of the recorder and alarm occurrence status.

Event summary display:
Displays event summary including alarm ON/OFF and issuance of messages.

Main unit information display:
Displays memory use conditions and information on the main unit such as the battery end warning.

Integrated value display:
Digitally displays the integrated value of each channel of the recorder.

■ FTP server (Internet Explorer 6 available.) Note 1

File download: Record files stored in compact flash (CF) can be downloaded from the browser.

File delete: Record files stored in CF can be deleted from the browser.

Access authentication: Authenticates access authority to FTP server.

■ SMTP (e-mail client)

Transmits e-mails to specified address under the following conditions.

(1) When an alarm turns on or off
(2) When DI is set to ON or OFF
(3) When an error occurs to the main unit (such as low battery or no memory space)
(4) At specified intervals

■ MODBUS TC/IP

Data read: Settings can be read through MODBUS TCP/IP communication.

Data write: Settings can be written through MODBUS TCP/IP communication.

Note1: Netscape isn't available.

Support software

The following software is provided as standard.

- Applicable PC: PC/AT-compatible machine
- Operation on PC98-series machines by NEC is not guaranteed.
- Operation on self-made or shop-brand PCs is not guaranteed.

■ Loader software for PC

Major function: Performs various parameter setting/change of the main unit

O/S: Windows 2000/XP, Windows 7 (Home Premium, Professional (Not applicable for 64 bit version))
(Windows Vista is not supported.)

Required memory: 64MB or larger

Disk drive: Windows 2000/XP/7-capable CD-ROM

Hard disk capacity: Free capacity of 30MB or larger required

Printer: Windows 2000/XP/7-capable printer and printer driver

Note) PC loader communication cable (type PHZP1801) is separately required.

■ Data viewer software

Major function: Regenerates the past trend record on the PC from the data in the compact flash. Provided with historical trend display and event display functions. Data can be changed to CSV file.

O/S: Windows 2000/XP, Windows 7 (Home Premium, Professional)
(Windows Vista is not supported.)

Required memory: 64MB or larger

Disk drive: Windows 2000/XP/7-capable CD-ROM drive

Hard disk drive: Free capacity of 30MB or larger required

Printer: Windows 2000/XP/7-capable printer and printer driver

Standard functions

Function	Description
Record range voluntary setting	Recording range can be set by channel.
Input type setting	Input type can be set by channel. (Key operation on the front face) Set the same input type for every 2 channels.
Skip function	Skips arbitrary channel display/recording.
Trend display	Time display: Time is displayed at the top of the trend display screen. Alarm display: On occurrence of an alarm and the restoration, alarm is displayed in the alarm display field. The CompactFlash usage is displayed with a bargraph at the top.
TAG name display	By channel, Maximum of 8 characters.
Screen name display	Displays the screen name (maximum of 16 characters).
Unit creation	Industrial units can be arbitrarily created, Maximum of 7 digits, 12 types.
Scaling function	Arbitrary scaling is allowed in the case of DC voltage input. Decimal point position can also be arbitrarily set in the range from -32767 to 32767.
PV shift	Shift the zero point and slant of the reading.
Input filter	Prevents sudden fluctuation of input for each channel (primary delay filter). Time constant: 0 to 900 seconds.
Burnout function	Displays the break of thermocouple/resistance bulb input by scaling out to 100% side.
Historical trend display	Regenerates and displays the data stored in the CompactFlash by scrolling the screen. Displays data of a designated time.

Table 1. Recording capacity

Decide the recording capacity, referring to the table below.

- Recording data format: ASCII
- Recording type: Max/Min recording
- No alarm, nor message, nor other events.

File size	9 points input		18 points input	
	Display refresh cycle	Recordable capacity	Display refresh cycle	Recordable capacity
64MB	1sec	112hours	1sec	56hours
	10sec	46days	10sec	23days
	30sec	140days	30sec	70days
	1min	280days	1min	140days
	10min	7.7years	10min	3.8years

27 points input		36 points input	
Display refresh cycle	Recordable capacity	Display refresh cycle	Recordable capacity
1sec	37hours	1sec	28hours
10sec	15days	10sec	11days
30sec	46days	30sec	35days
1min	93days	1min	70days
10min	2.5years	10min	1.9years

File size	9 points input		18 points input	
	Display refresh cycle	Recordable capacity	Display refresh cycle	Recordable capacity
256MB	1sec	18days	1sec	9days
	10sec	187days	10sec	93days
	30sec	1.5years	30sec	273days
	1min	3years	1min	1.5years
	10min	—	10min	15years

27 points input		36 points input	
Display refresh cycle	Recordable capacity	Display refresh cycle	Recordable capacity
1sec	6days	1sec	112hours
10sec	60days	10sec	46days
30sec	185days	30sec	140days
1min	1year	1min	280days
10min	10years	10min	7.7years

Compact Flash size	9 points input		18 points input	
	Display refresh cycle	Recordable capacity	Display refresh cycle	Recordable capacity
512MB	1sec	36days	1sec	18days
	10sec	1year	10sec	182days
	30sec	3years	30sec	1.5years
	1min	6years	1min	3years

27 points input		36 points input	
Display refresh cycle	Recordable capacity	Display refresh cycle	Recordable capacity
1sec	12days	1sec	9days
10sec	120days	10sec	93days
30sec	1year	30sec	280days
1min	2years	1min	1.5years

Compact Flash size	9 points input		18 points input	
	Display refresh cycle	Recordable capacity	Display refresh cycle	Recordable capacity
1GB	1sec	72days	1sec	36days
	10sec	2years	10sec	1year
	30sec	6years	30sec	3years
	1min	12years	1min	6years

27 points input		36 points input	
Display refresh cycle	Recordable capacity	Display refresh cycle	Recordable capacity
1sec	24days	1sec	18days
10sec	240days	10sec	187days
30sec	2years	30sec	1.5years
1min	4years	1min	3years

- When the number of input points goes on increasing, the period becomes as follows.
  - 18 input points; The period is approximately one half of those listed in the table.
  - 27 input points; The period is approximately one-third of those listed in the table.
  - 36 input points; The period is approximately one-fourth of those listed in the table.
- In binary format, the period is approximately 4 times as long as those listed in the table.
- For recording type of mean or instantaneous value, the number of days is approximately 2 times as long.

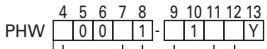
When compact flash is not used, up to 5M bytes of the recording data and event data can be stored in the main unit. (In case of 36-channel in Max/Min recording, approximately 36,000 data can be stored. For 10 hours at the display refresh cycle of 1 second. The number of the data saved varies depending on the number of the event data. Also, the number of the recording data allowing the historical display is fixed to 400 data.)

Table 2. Storage Capacity

The recording can be made for the period of time listed in the tables shown below under the following conditions.

- Recording data format: ASCII
- Recording type: Max/Min recording
- No alarm, nor message, nor other events.

CODE SYMBOLS



Digit	Specifications	Note
4	<Number of input points> 9 points 18 points 27 points 36 points	
7	<DI input> Without With (16 points)	
8	<Modification No.(fixed)>	
9	<Display (instruction manual)> Japanese English	
11	<Alarm output> Without 10 relay points 20 relay points Transistor (open collector) 16 points 10 relay points + transistor (open collector) 16 points 20 relay points + transistor (open collector) 16 points	
12	<Ethernet> Without With	

SCOPE OF DELIVIRY

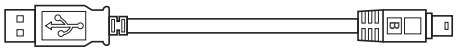
Item		Quantity
Recorder (PHW)		1
Panel mounting bracket		2
CD-ROM	PC support software instruction manual	1
Noise filter for the power supply		1

OPTIONAL ITEMS

Item	Code	Specification
Shunt resistor for DC current input	PHZP0101	10Ω ±0.1%
PC loader communication cable	PHZP1801	Length 3m with connector USB-A/USB miniB terminal *
CD-ROM with instruction manual and support software	PHZP2601	
PC card adaptor	PHZP0501	For CompactFlash
CompactFlash	PHZP2801-512 PHZP2801-01G	512MB 1GB

* Shape of this cable is shown below

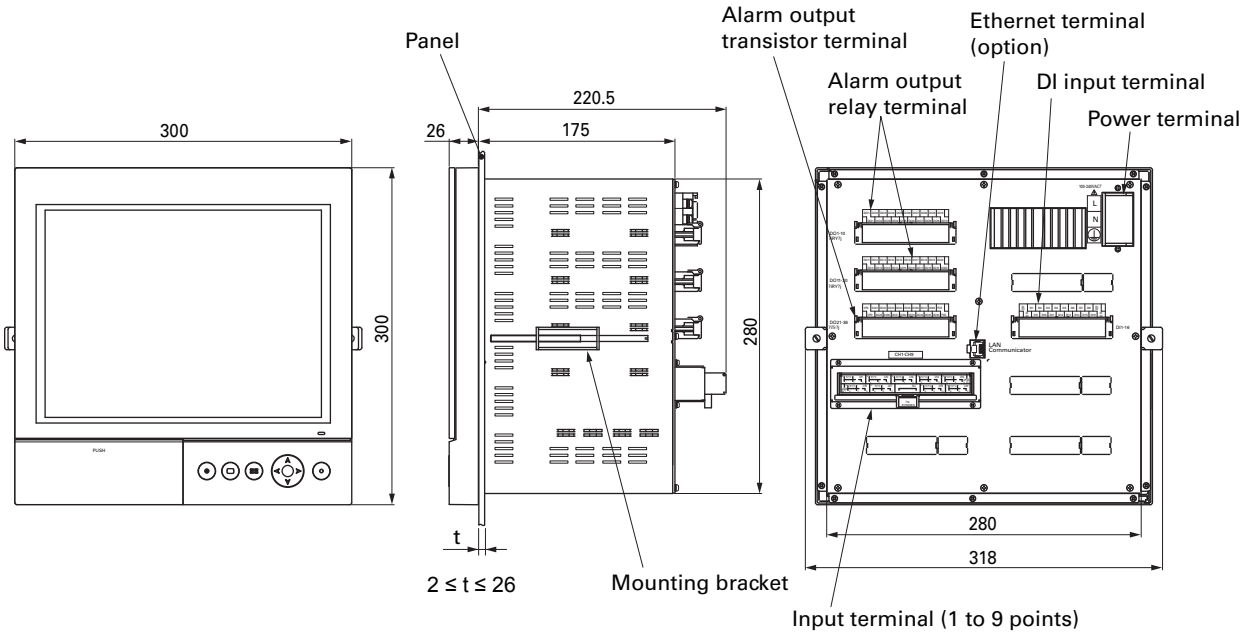
USB (A) male – USB (Mini-B) male



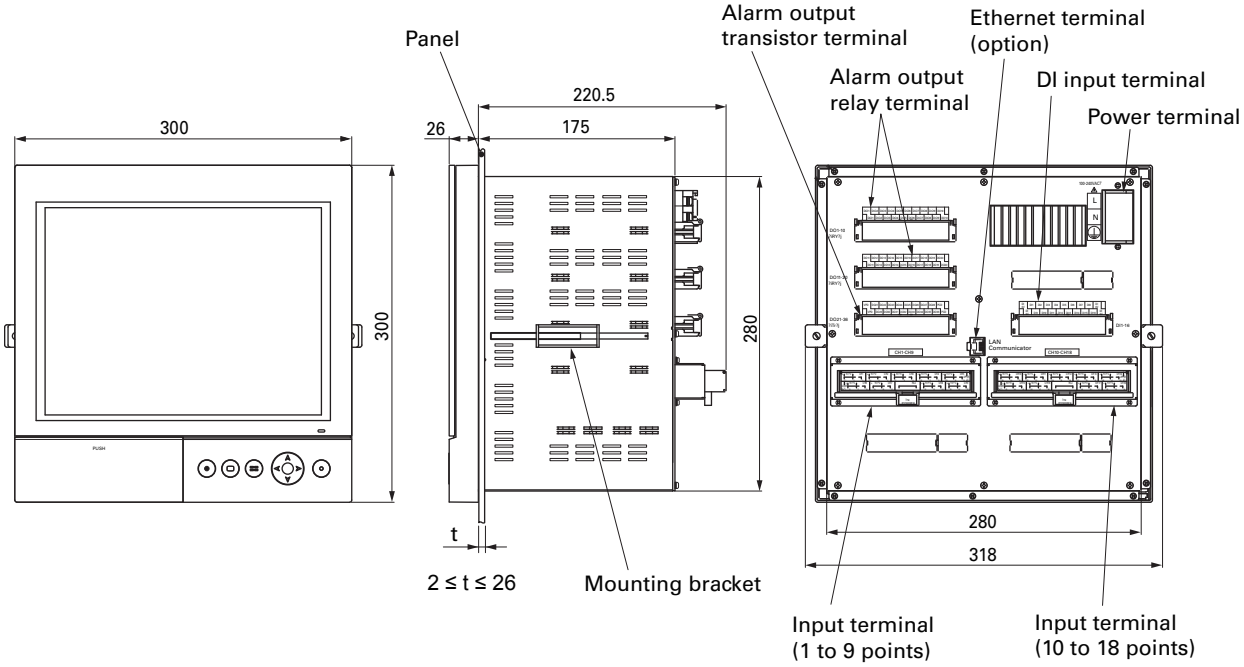
OUTLINE DIAGRAMS (Unit : mm)

PANEL MOUNTING TYPE

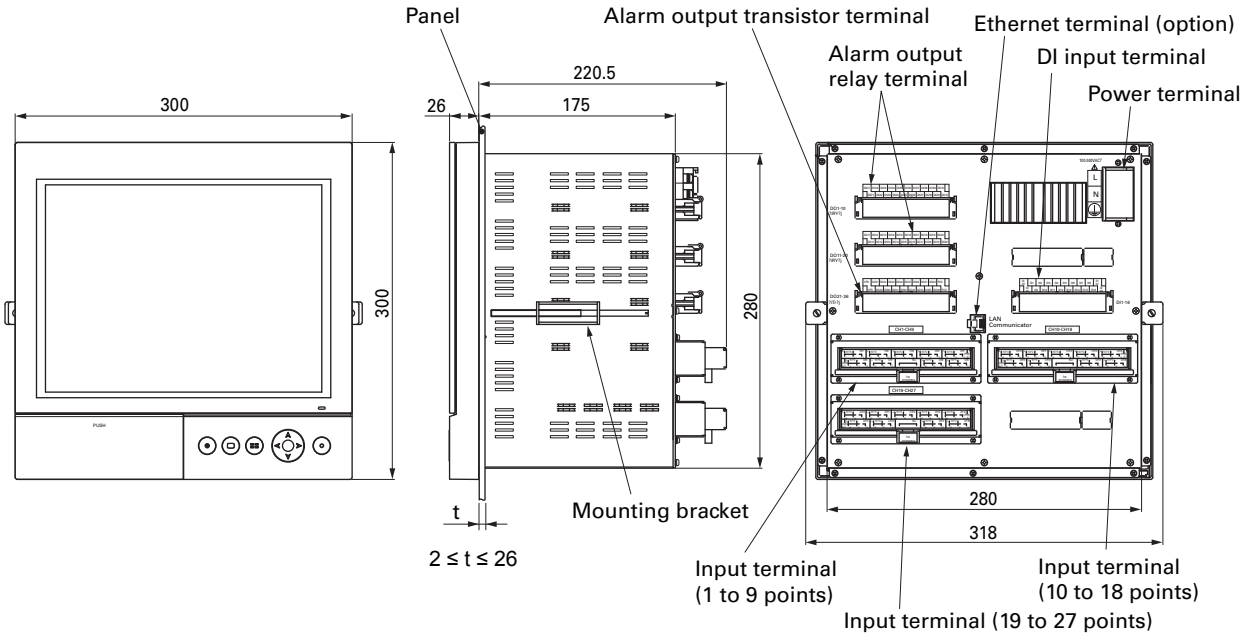
In the case of 9-point input



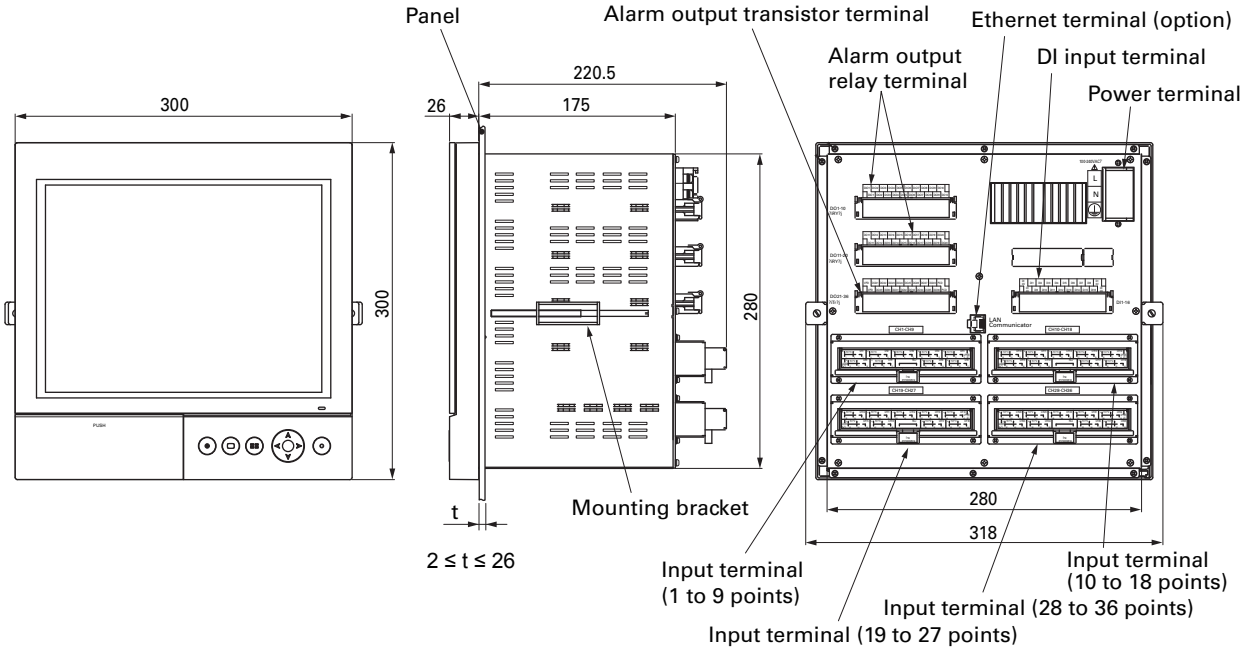
In the case of 18-point input



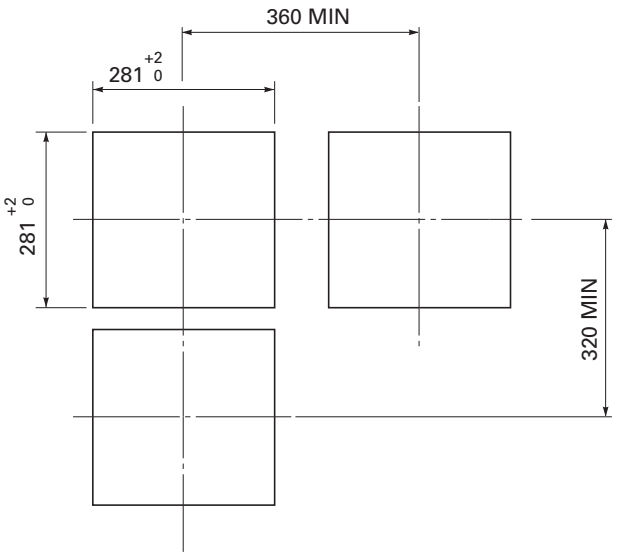
In the case of 27-point input



In the case of 36-point input



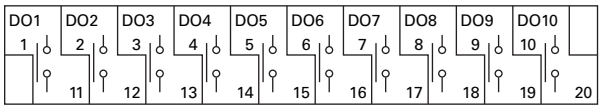
PANEL CUTOUT SIZE



EXTERNAL CONNECTION DIAGRAMS

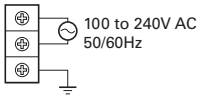
Alarm output relay terminal

M3 screw



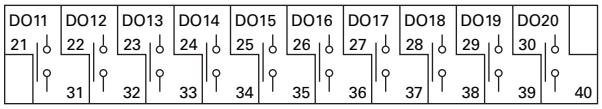
Power terminal

M4 screw



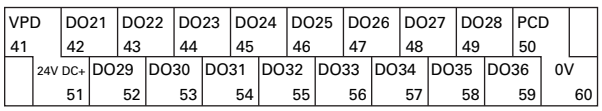
Alarm output relay terminal

M3 screw



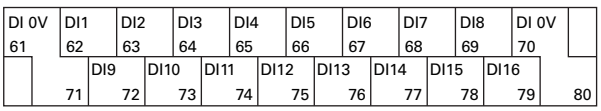
Alarm output transistor terminal

M3 screw



DI input terminal

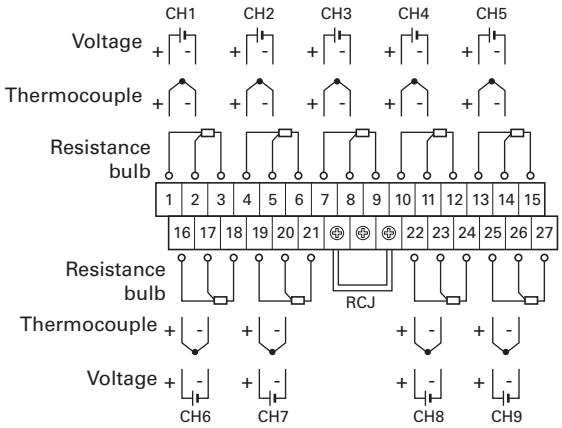
M3 screw



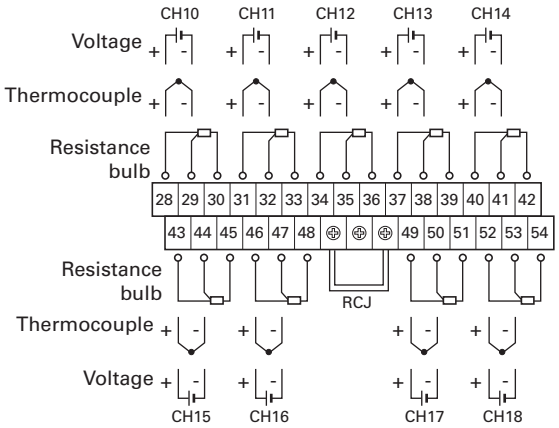
Input terminal

M3 screw

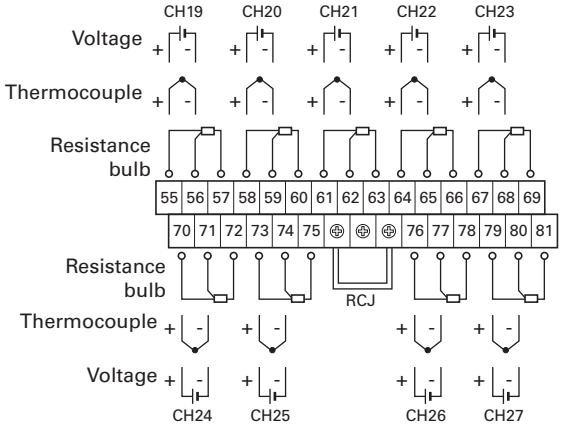
Number of input points = 1 to 9 points



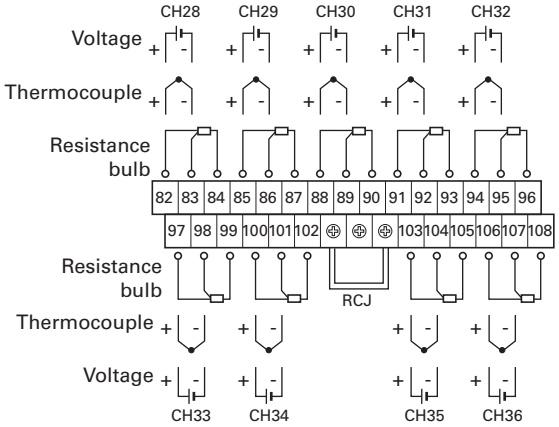
Number of input points = 10 to 18 points



Number of input points = 19 to 27 points



Number of input points = 28 to 36 points



Note) For current input, connect an optional shunt resistance to a voltage input terminal.

SELECTING INPUT TYPE

The input type is the same every 2 channels.
The input type of channel 2, 4, 6, 8, 11, 13, 15, 17, 20, 22, 24, 26, 29, 31, 33 and 35 can only be set in the same category of previous channel.
Note, however, that input type can be arbitrarily selected only for channels 9, 18, 27 and 36 irrespective of the type allocated to other channels.
The following input types are available.

Input type	Details
Thermocouple, 50mV	K, E, J, T, R, S, B, N, W, L, U, and PN thermocouples, 50mV
Resistance bulb	Pt100, JPt100
500mV	500mV
5V	1 to 5V, 0 to 5V
Other channels	Other channels (*1)

*1: Using channels enables the same input type to be displayed or recorded to other channels. For example, when daily totalizing is carried out on channel 1, the same input type as channel 1 can be totalized monthly on channel 37. Also, it can be used for F value calculation.

	Input type	Calculation	Display/recording
Channel 1	K thermocouple	—	Displays and records temperature
Channel 2	Other channel 1	F value calculation	Displays and records F value

Example of channel input type selection (for 18 points input)

	Input type	Input type	Description
Channel 1	K thermocouple	Thermocouple, 50mV	The type of thermocouple can be arbitrarily selected for each channel.
Channel 2	T thermocouple		
Channel 3	1-5V	5V	
Channel 4	0-5V		
Channel 5	Pt100	Resistance bulb	The type of resistance bulb can be arbitrarily selected for each channel.
Channel 6	JPt100		
Channel 7	500mV	500mV	
Channel 8	500mV		
Channel 9	J thermocouple	Thermocouple, 50mV	Input type can be arbitrarily selected for channel 9.
Channel 10	K thermocouple	Thermocouple, 50mV	The input type of the thermocouple and 50mV is the same.
Channel 11	50mV		
Channel 12	Skip	5V	Skip and other channel can arbitrarily be selected irrespective of the input type.
Channel 13	1-5V		
Channel 14	Pt100	Resistance bulb	
Channel 15	Skip		
Channel 16	Other channels	500mV	
Channel 17	500mV		
Channel 18	50mV	Thermocouple, 50mV	Input type can be arbitrarily selected for channel 18.

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⚠ Caution on Safety

*Before using this product, be sure to read its instruction manual in advance.

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Printed in Japan